

U.S. Patent Application Serial No. 10/520,281
Filed April 18, 2007

IN THE CLAIMS: This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1. (Currently Amended): A vehicle impact attenuator comprising:

 a shock absorber that deforms upon a collision of a vehicle to thereby reduce the impact on the vehicle;

 a support for the shock absorber; and

 a holding portion that holds the support in a vertical position in an installation area;

 the support or the holding portion having a release portion that fractures upon application of a load equal to or exceeding a set value, to thereby release the support from being held in a vertical position in the installation area,

 the support being plastically deformable by a load lower than the set value,

the support being a pipe-like member which has an outer diameter of 114.3 to 318.5 mm and a wall thickness of 1.6 to 20 mm,

the plastic deformation occurs as a flattening of the pipe-like member, and

the yield point load that causes the flattening as the plastic deformation of the support being

U.S. Patent Application Serial No. 10/520,281
Filed April 18, 2007

not less than 25 kN and not more than 800 kN.

Claim 2. (Currently Amended): The vehicle impact attenuator according to claim 1, wherein:

the support is a pipe-like member;

the holding portion comprises a connecting portion fixed on a lower part of the support, and anchor bolts that are implanted in the installation area to thereby hold the connecting portion in the installation area and that function as the release portion;

the anchor bolts being capable of fracturing upon application of a load equal to or exceeding the set value.

Claim 3. (Currently Amended): The vehicle impact attenuator according to claim 1, wherein:

the holding portion comprises a burying hole formed in the installation area to accommodate a lower part of the support;

the support is a pipe-like or rod-like member provided with cuts that are positioned above the installation area when the support is accommodated in the burying hole; and

the cuts serve as fracture starting points when a load equal to or exceeding the set value is

applied, and function as the release portion.

Claim 4. (Canceled):

Claim 5. (Original): The vehicle impact attenuator according to claim 1, wherein:
a coil that plastically deforms upon application of a load equal to or exceeding a predetermined value is further provided;
the holding portion comprises a burying hole formed in the installation area to accommodate a lower part of the support;
the support is a pipe-like member that plastically deforms upon application of a load lower than the set value;
the ends of the coil are positioned above and below the release portion and attached to an upper part of the support, which is released by the vehicle collision, and to the holding portion or a lower part of the support, which remains held after the vehicle collision.

Claim 6. (Original): The vehicle impact attenuator according to claim 5, wherein the coil has
a helical shape comprising approximately circular turns;

U.S. Patent Application Serial No. 10/520,281
Filed April 18, 2007

the coil having a coil diameter of not less than 110 mm and not more than 130 mm, a wire diameter of not less than 30 mm and not more than 40 mm, and a number of turns of not less than 3 and not more than 20; and

the coil being made of structural steel.

Claim 7. (Original): The vehicle impact attenuator according to claim 1, wherein:

a plurality of the supports are held adjacent to each other in the installation area; and
the shock absorber is supported by all of the supports.

Claim 8. (Original): The vehicle impact attenuator according to any one of claims 3, 4 and 5, wherein:

the support is accommodated in the burying hole and comprises a fitting member that engages and holds a lower part of the support; and
the fitting member has strength sufficient to approximately retain its original shape after the fracture of the release portion.

Claim 9. (Currently Amended): The vehicle impact attenuator according to any one of claims 2, 4 and 5, wherein:

U.S. Patent Application Serial No. 10/520,281
Filed April 18, 2007

the set value for the fracture of the release portion is not less than 50 kN and not more than 900 kN; and

~~the yield point load that causes the flattening as the plastic deformation of the support is not less than 25 kN and not more than 800 kN.~~

Claim 10. (Original): The vehicle impact attenuator according to claim 9, wherein the pipe-like member is made of iron or plastic;

the pipe-like member having an outer diameter of not less than 100 mm and not more than 800 mm; and

a wall thickness of not less than 0.8 mm and not more than 100 mm.

Claim 11. (Original): The vehicle impact attenuator according to claims 2, 4 and 5, wherein the pipe-like member contains an internal cushioning material.